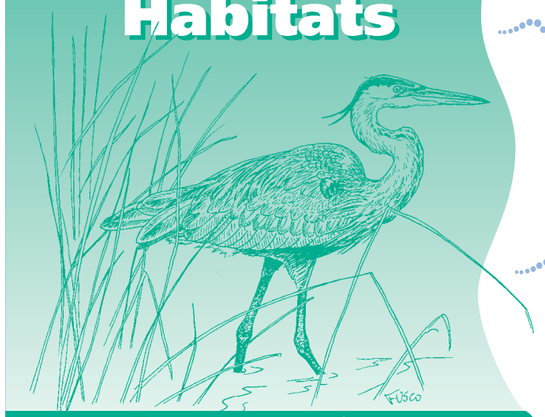
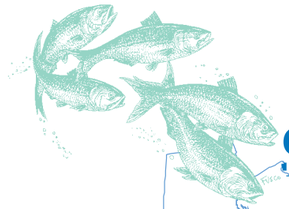
Restoring Long Island Sound's Habitats



2002

Restoration Sites

Blue indicates Completed Site – Construction on the project is finished, but monitoring may be on-going
Green indicates In Progress Site– some phase of the project is underway, e.g. applying for funding, design, or construction
Black indicates Potential Site – a restoration project has been identified, no action taken yet
Boldface in all colors indicates high-ranked sites



CONNECTICUT

NEW YORK

LONG ISLAND SOUND

Housatonic River
Quinnipiac River
Connecticut River
Thames River
Old Saybrook
Stonington
Greenwich
Rye
Bronx
Queens
Huntington
Nissequogue River
Brookhaven
Southold

COMPLETED RESTORATION SITES
IN PROGRESS RESTORATION SITES
POTENTIAL RESTORATION SITES
PROJECT BOUNDARY
RIVER

Connecticut

BRANFORD
Branford River STP (TW)
Branford R./Christopher Rd. (TW)
Branford R./St. Agnes Cemetery (TW)
Branford R./Hickory Rd. (TW)
Branford R. tributary/Mill Creek (TW)
Farm River (TW)
Farm R. tributary/Pent Rd. (TW)
Farm R. tributary/Cynthia Ct. (TW)
Flying Point/Prospect Hill Rd. (TW)
Juniper Point (TW)
Lindsey Cove east (TW)
Lindsey Cove west/Castle Rock (TW)
Pages Cove north (Short Beach) (TW)
Pages Cove (Killan's Point) (TW)
Pine Orchard golf course (TW)
Sybil Creek (TW)
Tabor Drive Marsh (TW)
Three Elms Rd. (TW)
Tilcon Wetland (TW)
Ward's Millpond/Branford River W.M.A. (RMC/FW)
West Point Road (TW)

BRIDGEPORT
Ash Creek/Rooster River (TW)
Bunnells Pond (RMC)
Grover Hill (TW)
Pleasure Beach (BD)
Yellow Mill Channel to Stillman Pond (RMC)

CHESTER
Carini Preserve (RMC)

CLINTON
Chapman's Pond Dam (RMC)
Clinton Harbor (SAV/SR/TW)
Hammock River (TW)
Hammonasset River tributary (TW)
Indian River (TW)
Indian River south of RR track (TW)
Upper Mill Pond Dam (RMC)

CROMWELL
Cromwell Meadows (RMC)

DARIEN
Five Mile River Marsh (TW)
Gorhams Pond (EE/RMC)
Holly Pond (RMC/EE)
Noroton River at I-95 (RMC)
North Scott Cove-Arrowhead Way (TW/EE)

DEEP RIVER
Piano Works Dams (RMC)
Pratt Cove (TW)

EAST HADDAM
Chapman Pond (TW)
Salmon River (RMC)

EAST HAVEN
Caroline Creek between Minor and Stanton Rds. (TW)
Caroline Creek/Cosey Beach (TW)
Farm River (TW)
Farm River tributary/Edgemere Rd. (TW)
Morris Creek/Sibley Lane (TW)
New Haven Airport (TW)

EAST LYME
Brides Brook Culvert (RMC/TW)
Crescent Park/Manwaring Rd. (TW)
Fourmile River Dam (RMC)
Indian Pond (EE)
National Guard camp (TW)
Old Black Point Spit (BD/F)
Upper Pattagansett River (TW)
Niantic River (SAV)

EAST WINDSOR/ENFIELD
Scantic River (RMC)

ESSEX
Dennison Pond Dam (RMC)
Great Meadows (TW)
Thatchbed Island (TW)

FAIRFIELD
Ash Creek, Rooster River (TW)
Lower Ash Creek/Kenard St. (TW)
Fairfield Creek/Grasmere (TW)
Mill River/Samp Mortar Lake Dam (RMC)
Mill River/Tide Mill Dam (RMC)
Penfield and Beach Roads (FW)
Penfield Reef (SR)
Perrys Millpond (TW)
Pine Creek East (TW)
Sasco Brook Dam (RMC)
South Pine Creek/Par 3 golf course (TW)
West of marina/Turney Road (TW)

GREENWICH
Greenwich Cove Dr. (TW)
Greenwich Point Park (TW)
Mead Point Dr. (TW)

GROTON
Birch Plain Creek (TW)
Bluff Point Natural Area Preserve (F)
Bluff Point Coastal Reserve (TW)
Bluff/Bushy Point Beach (BD)
Haley Farm (G)
Hyde Pond Dam (RMC)
Mumford Cove (BD)
Mystic River (SAV)
Noyes Property (TW)
Spencer Point (TW)
Willow Point (TW)

GUILFORD
East River (TW)
Grass Island (TW)
Landon Dam (RMC)
Leetes Island (TW)
Lost Lake (TW)
Old Quarry Rd./Hoadley Neck (TW)
Seaside Avenue (TW)
Sluice Creek (TW)
Vineyard Haven (TW)
West River (RMC)
Upper West River (TW)

HADDAM
Higganum Creek (RMC)
Rutty Creek (TW)
Salmon River (RMC)

HAMDEN
Quinnipiac River marshes (TW)
West bank of Mill River (RMC/FW)

LEDYARD
Poquetanuck Cove (TW/F)

LYME
Ed Bills Pond Dam (RMC)
Hamburg Cove (SAV)
Nott Island (TW)
Lord Cove (TW)
Lower Pond Dam (RMC)

MADISON
Bailey Creek (TW)
Fence Creek (TW)
Seaview Beach (TW/BD)
Hammonasset River north (TW)
Hammonasset S.P./Tom's Creek (TW)
Hammonasset S.P./filled wetland (TW)
Kelsey Place (TW)
Neck River/Garnet Park Rd. (TW)
Neck R. tributary (TW)
Selden Neck (TW)
Windy Brook Lane (TW)
Windy Brook Lane/east of golf course (TW)

MERIDEN
Hanover Pond Dam (RMC)

MIDDLETOWN
Lower Mill Pond Dam (RMC)
Savage Mill Dam (RMC)
Starr Millpond/Coginchaug River (RMC)

MILFORD
Beaver Brook (TW/FW)
Calf Pen Meadow Creek (TW)
Charles Island (F)
Clark Pond Dam (RMC)
Dredge mining sites (RMC)
Fowler Island (TW)
Great Creek/Marsh (TW)
Great Flat (TW)
Hilldale Road area (TW)
Howard Ct./Morehouse Ave. (TW)
Indian River between I-95 and railroad track (TW)
Milford Point (BD)
Oyster River (TW)
Rogers Ave./Milford Harbor tributary (TW)
Seabreeze Ave./Merwin Ave. (TW)
Turkey Hill Brook (TW)
Welches Point Rd. (TW)
Wheeler Marsh (TW)
West of sand and gravel company (TW)
West side of Gulf Pond (TW)

MONTVILLE
Trading Cove Brook (RMC)

NAUGATUCK
Union City Dam (RMC)

NEW HAVEN
Hemingway Creek (TW)
Long Wharf Flats (IF)
Mill River east bank/south of RR tracks (TW)
Mill River, north of I-91 (RMC/EE/TW)
Morris Creek/Lighthouse Pt. (TW)
Nathan Hale Park/Forbes Bluff (CB)
New Haven Airport (TW)
Pond Lily Dam (RMC)
Quinnipiac River Marsh (TW)
West River Salt Marsh (TW)

NEW LONDON
Mitchell College (BD)

NORTH HAVEN
Quinnipiac River north (TW)
Quinnipiac River south (TW)

NORWALK
Chimon Island (F)
Flock Process Dam (RMC)
Harborview (TW)
Indian River (RMC)
NE Wilson Cove (TW)
Norwalk River/Perry Ave. flood gate (RMC)
Oyster Creek (TW)
Sheffield Island (BD)
Sheffield/Plains/Shea Island Complex (F)
Silvermine R./Perry & Timber ponds (RMC)
Village Creek (RMC/TW)

OLD LYME
Big Pond (TW)
Black Hall River (TW)
Calves Island (TW)
Duck River (TW)
Finnegan Farm Lane (TW)
Fourmile River Dam (RMC)
Goose Island (TW)
Great & Upper Islands (TW)
Griswold Point (BD)
Lieutenant River (TW)
Lord Cove (TW)
Lower McColloch Dam (RMC)
Pond Road/Soundview (TW)
Rogers Lake (RMC)
Saltworks Point (TW)
Upper Mill Pond Dam (RMC)
White Sands Beach, west (TW)

OLD SAYBROOK
Ayers Road (TW)
Beamon Creek (TW)
Chalker Millpond Dam (RMC)
Cold Spring Brook /Chalker Beach (TW)
Ferry Rd. east (TW)
Ferry Rd. north (TW)
Fishing Brook Dam (RMC)
Hagar Creek (TW)
Knollwood (TW)
Lynde Point (TW)
Lynde Point (BD)
Mill Meadows (TW)
North Cove (TW)
Otter Cove (TW)
Ragged Rock/Ferry Rd. (TW)
Ragged Rock Creek (TW)
South Cove (EE/SAV)
South Cove, north section (TW)

ORANGE
Housatonic River/sand & gravel pits (RMC)

PRESTON
Hallville Pond Dam (RMC)
Poquetanuck Cove (F/TW)
Route 2A bridge (TW)

SEYMOUR
Kinneytown Dam (RMC)
Tingue Dam (RMC)

SHELTON
Derby Dam (RMC)
Housatonic River/sand & gravel pits (RMC)
Farmill River (RMC)

SPRAGUE
Versailles Pond Dam (RMC)

STAMFORD
Holly Pond (RMC/EE)
Kosciuszco Park (TW/IF)
Main Street Dam (RMC)
Noroton River at I-95 (RMC)
Stamford Marine Center/Magee Ave (TW)

STONINGTON
Collins Rd. Marsh (TW)
Little Narragansett Bay (SAV)
Lords Point (TW)
Mystic River (SAV)
Quiambog Cove (TW)
Ram Island (F)
Velvet Mills (TW)

STRATFORD
Avco-Lycoming field (TW)
Bridgeport Airport (TW)
Carting/Peacock Islands (TW)
East Johnson Creek/north Lewis Gut mouth (TW)
Farmill River (TW)
Ferry Creek (TW)
Frash Pond (EE)
Great Meadows/north of Lordship Blvd.(TW)
Great Meadows/south of Lordship Blvd.(TW)
Long Island (TW)
Long Beach (BD)
Peck's Millpond (FW)
Pope Island (TW)
Russian/Lordship Beach (BD)
Sikorsky and Ryders Lane marshes (TW)

WALLINGFORD
Upper Quinnipiac River Dam (RMC)
Wallace Dam/Community Lake Dam (RMC)
Wharton Brook State Park (F/G)

WATERBURY
Anaconda Dam (RMC)
Freight Street Dam (RMC)

WATERFORD
Alewife Cove (EE/SAV)
Gardner Pond north (TW)
Goshen Cove (EE)
Harkness Memorial State Park (TW)
Jordan Millpond Dam (RMC)
Millers Pond Dam (RMC)
Niantic Bay Barrier (BD)
Niantic Bay northeast (TW)
Niantic River (SAV)
Quaker Hill north (TW)
River Street (TW)
White Point (TW)

WEST HAVEN
Club Creek (TW)
Cove River (TW)
Old Field Creek (TW)
Oyster River/north of New Haven Ave. (TW)
Sandy Point (BD)
Sewage Treatment Plant wetland (TW)
West River (TW/RMC)

WESTBROOK
Chapmans Pond Dam (RMC)
Hammock River (TW)
McVeagh Dam (RMC)
Menunketesuck Island (BD)
Menunketesuck River (TW)
Patchogue River (TW)
Quotonset Beach (TW)
Westbrook Town Beach (BD)

WESTPORT
Cockenoe Island (F)
Greens Farm Brook (TW)
Grove Point/Sherwood Millpond (TW)
Lees Pond (RMC)
North of Sherwood Millpond and I-95 (TW)
Sasco Brook (TW)
Sasco Brook Dam (RMC)
Saugatuck River Dam (RMC)
Saugatuck River north of Route 1 (TW)
Sherwood Millpond (EE/TW)

WILTON
Cannondale Dam (RMC)
Merwin Meadows (RMC)

WINDSOR
Rainbow Dam (RMC)

New York

BRONX
Bronx Oyster Reefs (SR)
Bronx River mouth (TW/F/RMC)
Bronx River Trailway (TW/FW/F/RMC)
City Island Marsh (TW)
Eastchester Bay (TW)
Ferry Point Park (G/BD)
Ferry Point Park Shoreline (TW)
Hutchinson River/DOT property (TW)
Oak Point Freightyards (TW/IF/fisheries habitat)
Palmer Inlet (TW)
Pelham Bay Park Lagoon (TW/F)
Pugsley Creek (TW)
Rice Stadium Wetlands (TW/G/F)
Seton Falls Park (FW/F/CB)
Soundview Park (TW)
Turtle Cove (TW)
Weir Creek (TW)
Westchester Creek (TW)

BROOKHAVEN
Aunt Amy's Creek (FW/TW)
Cedar Beach (BD)
Cedar Beach boat ramp, east side (BD/TW/IF)
Crystal Brook Inlet (TW/FW)
Former Old Man's Boatyard site (TW)
Hagerman Landing Road Groin (BD/CB/IF)
McAllister County Park (FW/BD/FW/IF)
Mount Sinai Harbor (TW/EE/IF)
North Shore Horse Showgrounds (TW/IF)
Pipe Stave Hollow/Chandler Estate Swale (TW/FW/CB/F/IF)
Port Jefferson Village Beaches (BD)
Satterly Landing (TW)
Setauket Mill Pond (FW/F/IF/TW)
Shoreham Plant Wetlands (TW/BD)
Shoreham Point (TW)
Stony Brook Creek & Pond (TW/FW)
Stony Brook Harbor (TW)
Unnamed Creek & Pond (FW)
Wading River (TW/F/FW/BD/IF)
Wading River Wetland #W7 (FW)
Wading River Wetland #W9 (FW)
West Meadow Beach (BD)
West Meadow Creek (TW/IF/EE)

HUNTINGTON
Betty Allen Nature Park (FW/TW)
Centerport Ponds (TW/FW/IF)
Cold Spring Harbor (TW/BD/F/CB/IF)
Cold Spring Ponds (Huntington Wetland #H-1) (TW/IF/FW)
Crab Meadow (TW/FW/BD/IF)
Fresh Pond (FW/F/BD)
Hecksher Park Pond (FW)
Lloyd Harbor Wetland #L17 (FW)
Mariner's Inn (TW/BD)
Tidal Basin on Lloyd Neck (TW/BD)
Twin Ponds Park (TW/FW)

MAMARONECK
Greacen Point (TW/IF)
Hommock Marsh (TW)

MOUNT VERNON
Glover Field (FW)

NEW ROCHELLE
Echo Bay (TW/SR/F/RI)
Former Dickerman's Pond (FW)
Nature Study Woods (F/FW)
Pryer Manor Marsh (TW)

NORTH HEMPSTEAD
Baxter Estates Pond (FW)
Hempstead Harbor (EE/IF/TW)
Lake Success (FW)
Leed's Pond (FW)
Manhassett Bay (EE/TW/IF)
Mitchell Creek (TW)
Mott's Cove (TW)
Sheets Creek (TW)
Whitney Pond Park (FW)

OYSTER BAY
Bayville Wetland #B-7 (TW/FW)
Beaver Brook/Shu Swamp (FW)
Beaver Lake (FW)
Beekman Beach (BD/TW/IF/SAV)
Centre Island Beach (BD/TW)
Cold Spring Ponds (Huntington Wetland #H-1) (TW/IF/FW)
Glen Cove Creek (TW)
Hicksville Mill Pond (FW)
Hempstead Harbor (EE/IF/TW)
Huntington Wetlands #H2-H7 (FW)
Mill Pond (FW)
Oyster Bay Mill Pond (FW)
Oyster Bay NWR (TW)
Prospect Point to Sands Point Preserve (BD)
Red Spring Point Bluffs (CB)
Sudders Pond (FW)
Stehli Beach / Frost Creek Wetlands (TW/BD/IF)
West Pond (TW)

PELHAM
Glover Field (TW)

QUEENS
Alley Pond Park (FW/TW)
Aurora Pond (FW/F)
Bowery Bay (TW)
College Point Creek (TW)
College Point tidal creek (TW)
Cronheron Park (G)
Flushing Airport (FW/G/F)
Flushing Bay Timber Structures (fisheries habitat)
Flushing Bay/Flushing Creek (TW)
Flushing Meadow-Corona Park- Willow Lake (TW/FW/CB)
Forest Park Shrub Swamp (FW)
Fort Totten (TW/FW/CB/IF)
Hallets Cove (TW)
Kissena Park (G)
Powell's Cove Shoreline (TW/BD)
Steinway Creek Enhancement (TW)
Tallman Island (TW)
The Alley@Alley Pond Park (FW/F/TW/CB/IF)
Western College Point creeks (TW)

RIVERHEAD
Baiting Hollow (TW/FW/RMC)
Mattituck Wetland #MT-1 (FW)
Shoreham Point (TW)
Wading River (TW/RMC/F/FW)
Wading River Wetland #W7 (FW)

RYE
Beaver Swamp Brook (FW)
Beaver Swamp Brook/Cowperwood site (FW)
Blind Brook (FW)
Edith G. Read Wildlife Sanctuary (TW/F/EE/FW)
Marshlands Conservancy (TW/F/IF)

SMITHTOWN
Callahan's Beach (CB)
Fresh Pond (FW/F/BD)
Harrison Pond Town Park (FW/RMC/TW/F)
Landing Avenue Town Park (TW)
Long Beach (BD)
Nissequogue River/Riviera Dr., Kings Park (TW/FW/RMC)
Nissequogue River/Village of Nissequogue (TW/FW/RMC)
Schubert Beach (BD)
St. James Wetland #SJ16 (FW)
Stony Brook Harbor (TW/IF)
Sunken Meadow Creek (TW/BD/IF)
Sweetbriar Nature Center (G/TW/FW)
Young's Island (TW/IF)

SOUTHOLD
Bailey's Beach Park (BD/TW)
Clark's Beach/Inlet Pond (BD/CB)
Darby Cove (TW)
Goldsmith Inlet Beach (BD/TW/F/IF)
Great Pond (FW)
Greenport Wetland #GP11 (FW)
Mattituck Creek (TW/IF)
Mattituck Hills Wetlands #MH1& MH2 (FW)
Mattituck Wetland #MT20 (FW)
Orient Point Park (G/F/CB/RI)
Orient Wetland #O1 (FW)
Orient Wetland #O14 (FW)
Peconic Dunes Wetland Complex (FW)
Southold Wetland #SO28 (FW/F)
Southold Wetland #SO30 (FW/F)
Wolf Pit Lake (FW)

Types of Habitats

BD	Beaches and Dunes
CB	Cliffs and Bluffs
EE	Estuarine Embayments
F	Coastal and Island Forests
FW	Freshwater Wetlands
G	Coastal Grasslands
IF	Intertidal Flats
RI	Rocky Intertidal
RMC	Riverine Migratory Corridors
SAV	Submerged Aquatic Vegetation
SR	Shellfish Reefs
TW	Tidal Wetlands

Restoring Long Island Sound's Habitats

WHO ARE THE PARTNERS INVOLVED?

- US Environmental Protection Agency
- US Fish and Wildlife Service
- US Army Corps of Engineers
- NOAA National Marine Fisheries Service
- USDA Natural Resources Conservation Service
- Connecticut Department of Environmental Protection
- Connecticut Sea Grant
- New York State Department of Environmental Conservation
- New York Department of State
- New York Sea Grant
- New York City Department of Environmental Protection
- New York City Department of Parks and Recreation
- Audubon New York
- Save the Sound, Inc.

A partnership of concerned agencies and organizations working together to improve the Sound for the living resources that depend on it.

WHY ARE WE CONCERNED ABOUT LONG ISLAND SOUND'S HABITATS?

The coastal habitats of Long Island Sound form a unique and highly productive ecosystem that supports a diverse array of living resources. These living resources range from microscopic plants and animals that drift with the currents to economically important finfish, shellfish, and crustaceans. Other animals such as birds, sea turtles, and marine mammals spend all or part of their lives in the Sound, on its shores, or in its watershed. While there is still healthy habitat in and around Long Island Sound, there is little doubt that the overall abundance and diversity of habitats have been diminished by incompatible human uses of the Sound and its resources.

Present-day habitat conditions are very different from those observed by the first colonists. One third of all tidal wetlands in the Sound have been lost since the 1700s. Most of the remaining tidal wetlands have been altered by mosquito ditching. Once plentiful, eelgrass beds disappeared from the western and central portions of the Sound in the 1930s. Terrestrial habitats have been lost by clearing and filling for development. For example, 70 percent of Connecticut's original forested area was clear cut by the late 1800s. In the nearly 400 years since European settlers arrived, the radical alteration of the landscape has played a role in the decline of the Sound.

In the latter half of the twentieth century, scientists began to study the link between healthy habitat and healthy populations of fish and wildlife. Not only do we need adequate acreage of habitats, but those habitats must be healthy and functioning properly to support a diverse and resilient population of the Sound's living resources. To address these concerns, the Long Island Sound Study Habitat Restoration Initiative was created.

HOW DOES THE LONG ISLAND SOUND STUDY HABITAT RESTORATION INITIATIVE WORK?

As recommended in the Long Island Sound Study's Comprehensive Conservation and Management Plan, habitat restoration is being coordinated through the Long Island Sound Study Habitat Restoration Initiative, a partnership of concerned agencies and organizations working together to improve the Sound for the living resources that depend on it. With funding from the EPA Long Island Sound Office, the Connecticut Department of Environmental Protection and the New York State Department of Environmental Conservation are taking lead responsibility for implementing the Initiative.

The work of the Initiative is implemented by the Habitat Restoration Workgroup, a group of technical staff with expertise in habitat restoration from all of the agencies and organizations listed to the left. The following goals for habitat restoration were developed by the Habitat Restoration Workgroup and adopted by the Policy Committee of the Long Island Sound Study:

- Restore the ecological functions of degraded and lost habitats
- Restore at least 2000 acres and 100 river miles of habitats between 1998 and 2008
- Use partnerships to accomplish the restoration objectives and to leverage limited state, local, and federal funds

Workgroup partners meet several times a year to set priorities, discuss technical issues, and review work products. Each state has a habitat restoration coordinator who is funded by EPA and coordinates the activities of the Habitat Restoration Workgroup. The coordinators are also responsible for assisting partner agencies, local government and other groups with habitat restoration issues relevant to the Sound.

The Habitat Restoration Workgroup, in cooperation with the public and staff of concerned agencies, developed a database of potential restoration sites, then ranked them in order to set restoration priorities for the partners in seeking funds and undertaking projects. A map listing the potential restoration projects and their current status appears on the reverse side of this page. The projects are ranked based on ecological value, public benefit, and technical viability. The site ranking is used to help Habitat Restoration Workgroup members set funding and staffing priorities for restoration projects within the partner agencies. However, the Workgroup will assist any concerned group or local government with a restoration project, regardless of its rank.

WHAT TYPES OF HABITAT ARE BEING RESTORED?

The Initiative has targeted twelve important habitat types in the Sound for their support of living resources and water quality. Descriptions of the habitat types are found below. The abbreviations found after the names of the habitat types are used to denote which habitat types are found at the potential restoration sites listed on the other side of this page. The abbreviations are also used in the charts that track our progress.

BEACHES AND DUNES (BD) are the transitional sandy or cobble shoreline area between the land and the Sound. These dynamic systems are in a constant state of erosion and deposition due to tidal action, currents, and wind. Dunes can protect adjacent low-lying properties from flooding. Many rare plants and animals, such as prickly-pear cactus, golden-aster, beach heather, piping plover, and horned lark occur on this habitat complex.

CLIFFS AND BLUFFS (CB) are steep coastal slopes of glacial sands and till that are created through long-term wave erosion and sea-level rise. Rare plant communities, such as New York's dwarf beech forest, may be found here.

COASTAL AND ISLAND FORESTS (F) located in the project area may be dominated by species such as maple, oak, cedar, pine, and beech. No virgin tracts of old growth forest remain. Animals that may use this habitat include owls, bald eagles, and osprey. Forest stands on islands are of particular importance to nesting colonial water birds, such as egrets and herons, because they are relatively free of predators. Forests provide shade and oxygen, and help influence the local climate.

COASTAL GRASSLANDS (G) are open glacial outwash plains dominated by tall grasses, such as little bluestem and switchgrass. They often have diverse wildflower communities as well. These areas are critical habitat for many rare and endangered species, such as the grasshopper sparrow and regal fritillary butterfly. Grasslands are also important to birds of prey like the short-eared owl.

FRESHWATER WETLANDS (FW) are the transitional zone between the land and fresh water. These are areas where the water table is at, or near, the surface of the soil and there is no tidal influence. They are very diverse and may be dominated by trees, such as red maple, and shrubs, such as swamp azalea, or herbs such as cattail. These wetlands aid in groundwater recharge and store flood waters. They are also critical habitat to many rare plant and animal species.

ESTUARINE EMBAYMENTS (EE) are confined areas of the Sound that have narrow inlets and significant freshwater inflow. They are generally more shallow than the open Sound, and the restricted flow causes greater sedimentation. These areas are important nurseries for finfish and are concentration sites for wildlife. The best bay scallop production occurs in estuarine embayments.

INTERTIDAL FLATS (IF) are shallow areas of bays and harbors that lay between the spring high- and low-tide marks. These flats contain no rooted vegetation. The sediments may be muddy to sandy and support important species, such as juvenile flounder, clams, and crabs.

RIVERINE MIGRATORY CORRIDORS (RMC) are river systems that drain to the Sound. They are often bordered by flood plain trees and wetlands. Migratory species, such as Atlantic salmon, shad, and herring use these rivers to travel to fresh waters miles away from Long Island Sound to spawn. Recreational and commercial fisheries benefit when river corridors remain healthy and passable to migratory fish.

ROCKY INTERTIDAL ZONES (RI) are areas of exposed bedrock characterized by attached species such as barnacles, algae, and mussels. These zones fall between extreme high- and low-tides, which results in frequent exposure of the plant and animal residents to the air. The species which attach themselves to this habitat help filter nutrients from the water, and are a food source for other marine species.

SHELLFISH REEFS (SR) are formed by clusters of oysters and blue mussels. The reef structure sits on top of soft sediments and provides habitat and shelter for a variety of other finfish and invertebrate species. The shellfish are able to filter algae and particulate matter in the water column thereby improving water clarity.

SUBMERGED AQUATIC VEGETATION (SAV) beds are comprised of rooted plants, such as eelgrass and widgeon grass, which grow on shallow bay bottoms below the spring low-tide mark. These grassy beds provide vital refuge for juvenile fish and lobsters. The plants also trap sediments and use nitrogen from the water column, thereby improving water quality.

TIDAL WETLANDS (TW) are the transitional zone between the land and submerged systems. These areas are dominated by rooted plants that are flooded by the tide. Healthy wetlands help trap sediments, store flood waters, and reduce wave energy during storms. In addition, two thirds of all marine species depend on tidal wetlands for a portion of their life cycle.

HOW ARE SITES PRIORITIZED?

The Initiative partners developed ranking criteria based primarily on the potential ecological value of the degraded sites. Other factors, such as likelihood of success and public benefits of the project, are taken into consideration as well. The site ranking list is not the only criterion that determines the order in which projects are completed. Factors like available funding, local sponsors, and advanced project planning can make it much easier to complete a project, regardless of its rank. However, it is the site ranking list which helps direct the Initiative partners' efforts from year to year. The ranking criteria are listed below.

ECOLOGICAL CRITERIA:

- Size of the site to be restored
- Benefits of the restoration to trust species
- Potential to restore ecological functions at the site
- Potential to restore a diverse plant and animal community at the site

TRUST SPECIES are those species that are protected or managed by law, such as endangered and threatened species, managed fisheries, and game mammals.

OTHER CRITERIA CONSIDERED INCLUDE:

- Probability of success
- Community support for project
- Cost per acre of project
- Public access opportunity and open space value of site
- Potential surface and groundwater improvements associated with project

HOW ARE PROJECTS FUNDED?

Project funding comes from several sources. The Initiative partners use the prioritized list of candidate restoration sites to match projects to existing grant programs. Examples of federal grant programs include the US Environmental Protection Agency's 5-Star Challenge Grant Program, the US Fish and Wildlife Service's Partners for Wildlife Program, Natural Resource Conservation Service's Wildlife Habitat Improvement Program, and National Marine Fisheries Service's Community Based Habitat Restoration Grants. Examples of state-funded programs include Connecticut's Coves and Embayments Restoration Program and the Long Island Sound License Plate Fund, and New York's Clean Water, Clean Air Bond Act and Environmental Protection Fund. Private grants from charitable institutions and the Connecticut Corporate Wetland Partnership may also be used to complete projects. In some cases, agency staff may be able to simply add the needed work to their annual schedule of activities and complete the project with little or no additional cash funds. There are nearly as many funding scenarios as there are projects to be done. It is the job of the State Habitat Restoration Coordinators and the rest of the Habitat Restoration Workgroup to help get all the projects planned and funded, and they are available to answer questions about funding.

PROGRESS TO DATE:

A great deal of progress has been made toward the habitat restoration goals since they were adopted in 1998. In May of 2000, the Initiative partner agencies signed a Memorandum of Understanding (MOU) which states that they all agree to work toward the goals of the Initiative and share the responsibility for reaching those goals. A copy of the MOU can be found on the Long Island Sound Study web site at:
http://www.epa.gov/region01/eco/lis

Substantial physical progress toward the habitat restoration goals has been made as well. Since 1998, 336 acres and 39 river miles of Long Island Sound's habitat have been restored (Tables 1 & 2). Many of these projects have received grant funds due to the efforts of the Habitat Restoration Initiative partners. Increasing public awareness of the importance of healthy habitat has resulted in many local governments and non-governmental organizations taking part in habitat restoration projects. Many more projects addressing water quality improvements have been completed that will have an important indirect benefit on the Sound's habitat.

Table 1: ACRES OF HABITAT RESTORED, 1998 – 2001

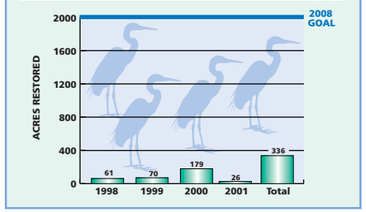
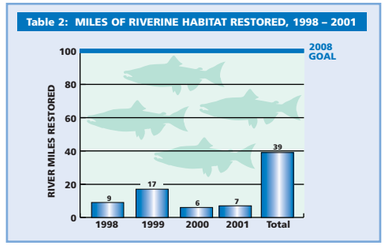


Table 2: MILES OF RIVERINE HABITAT RESTORED, 1998 – 2001



HOW DO PROJECTS GET DONE?

Each potential restoration project listed on the reverse side of this sheet represents a discrete location around Long Island Sound's shore or in the Sound's watershed. The sites represent a variety of habitat types, landowners, and varying levels of complexity. High priority projects are targeted by the state and federal agencies in the annual work planning process. The descriptions of a few projects which have been completed are summarized below. Each description will show the steps involved in restoration projects.

GRASSLAND RESTORATION SOUTHOLD, N.Y

Project Description: Orient Point County Park is owned by the Suffolk County Department of Parks and Recreation. The park displayed favorable soil conditions to restore the old agricultural fields on site to a coastal grassland community. Work on the 50-acre parcel was divided into 3 phases of about 17 acres each. During each phase, U.S. Fish and Wildlife Service staff used chainsaws and brush mowers to remove woody vegetation in the spring, then plowed and disked the soil using standard farm tractors. Once the soil was properly prepared, a specialized seed drill was used to plant a warm season grass mix. The principle species planted were little bluestem, big bluestem, indian grass, and switchgrass. Restoration work on the site was completed in 2000, but annual mowing is anticipated to continue indefinitely. The project is expected to benefit grassland nesting birds like the eastern meadowlark, raptors like the short-eared owl, and small mammals like the eastern cottontail rabbit. Migrating monarch butterflies were observed using the site in the fall of 2001.

Partners: US Fish and Wildlife Service (lead), Town of Southold, Suffolk County Department of Parks and Recreation, US Environmental Protection Agency (grant award), New York State Department of Environmental Conservation

RIVERINE MIGRATORY CORRIDOR RESTORATION LYME, CT

Project Description: Along the Eightmile River, a tributary to the Connecticut River, a dam was obstructing fish passage at Ed Bill's Pond. A steeppass fishway was constructed underneath a town bridge. This fishway, the second on the Eightmile River system, provides access to extensive spawning and nursery habitat for various anadromous species including Atlantic salmon, alewife, blueback herring, and sea-run brown trout.

Partners: CT DEP Fisheries Division (co-lead), Connecticut River Watershed Council (co-lead), USDA Natural Resources Conservation Service, Lyme Land Conservation Trust, and Connecticut Corporate Wetlands Restoration Partnership.

ANADROMOUS FISH are those that spend the adult phase of their lives in salt water, but move up streams and rivers to spawn in freshwater. Barriers on coastal streams and rivers prevent these fish species from reaching their natural spawning habitat and reduces their reproductive success

TIDAL WETLAND RESTORATION MADISON, CT

Project Description: During the late 1950s, a portion of the wetlands at Hammonasset State Park was used as a disposal area for sandy sediment that was dredged from nearby Clinton Harbor. Some of the filled wetland was converted to upland supporting grasses and red cedar, while part became degraded salt marsh. More recently, the invasive non-native genotype of the plant common reed *(Phragmites australis)* colonized most of the degraded wetland portions.

Restoration of approximately 5 acres of tidal wetland was accomplished through the removal of 1 to 3 feet of sandy dredged sediment. Four ponds were constructed and a network of meandering creeks was installed to provide adequate tidal flushing. A portion of the excavated sands was placed and graded on the adjacent upland and then planted with warm season grasses, such as little bluestem. The restoration work was completed in 2000. The site now supports marsh vegetation, and numerous egrets, shorebirds, and ducks are using the ponds.

Partners: US Fish & Wildlife Service, CT DEP Wetland Habitat and Mosquito Management, CT DEP Office of Long Island Sound Programs, EPA Long Island Sound Study and 319 Program, Ducks Unlimited, and Connecticut Waterfowlers Association.

TIDAL WETLAND RESTORATION OLD SAYBROOK, CT

Project Description: This 17-acre restoration site was first identified through a Coastal America partnership project with CT DEP and CT DOT. The investigation determined that the culvert connecting this wetland to the Oyster River was undersized and was causing a depression of the high water elevation by over one foot. CT DEP applied for Intermodal Surface Transportation Efficiency Act funds through CT DOT for design and construction. The project consisted of the installation of a second culvert (30" diameter) to complement the flows through the existing (24" diameter) culvert. A new concrete vault chamber was built to house an adjustable slide/flap gate. The gate can be manually lowered in advance of a forecast coastal flood to minimize tidal flooding of low-lying properties.

Partners: Funding for the project was provided by CT DOT's ISTEA Enhancement Funds (80%) and CT DEP's Long Island Sound Cleanup Account. Partners include the Town of Old Saybrook, CT DOT, EPA Long Island Sound Study, CT DEP OLISP and Inland Water Resources Management Division, and Coastal America. The project had the support of all adjacent property owners.

FRESHWATER WETLAND RESTORATION QUEENS, NY

Project Description: A natural glacial depression wetland in Forest Park was filled in 1966 to create two ball playing fields. The site hydrology made the ball fields prone to persistent flooding. In 2001, restoration of 6 acres of the site to freshwater wetland, and stabilization of the surrounding hillsides with native vegetation was completed.

Partners: New York City Department of Parks and Recreation (lead), New York State Department of Environmental Conservation (grant)

DUNE RESTORATION RYE, NY

Project Description: A flood protection berm created in Edith Read Sanctuary following the December 1992 nor'easter had become dominated by *Phragmites australis.* The berm was converted to a coastal dune system by the addition of clean sand and planted *Ammophila breviligulata,* and serves to enhance the educational opportunities at the site as well as to protect a newly restored adjacent marsh from wave action.

Partners: Westchester County Department of Planning, Westchester County Department of Parks, Recreation, and Conservation, and USDA Natural Resources Conservation Service

WHAT CAN I DO TO HELP RESTORE LONG ISLAND SOUND'S HABITATS?

- Sponsor or support local restoration projects
- Volunteer for citizen monitoring efforts
- Sponsor or participate in clean-up projects on vacant lots, public beaches, and roadsides
- Adopt "Sound Gardening" practices - Contact New York Sea Grant at 631-727-3910 or Connecticut Sea Grant at 203-432-5188 for more information
- Support habitat restoration and protection funding through license plate funds, federal and state duck stamp programs, and tax form check-offs
- Take photos of restoration sites near you to document site conditions over time
- Talk to your neighbors about the importance of habitat restoration

WHERE CAN I LEARN MORE ABOUT HABITAT RESTORATION AND LONG ISLAND SOUND?

Please visit these web sites:

Society for Ecological Restoration
www.ser.org/definitions.htm

Association of State Wetland Managers
www.aswm.org/wetlinks.htm

Restore America's Estuaries
www.estuaries.org

National Marine Fisheries Service
www.nmfs.gov/habitat/restoration/nspage.html

USDA Stream Corridor Restoration Page
www.usda.gov/stream_restoration/ newgra.html

Save the Sound, Inc.
www.savethesound.org/mb_habitat.htm

Or contact the offices listed below:

EPA Long Island Sound Office
Stamford Government Center
888 Washington Blvd.
Stamford, CT 06904-2152
203-977-1541 in Connecticut
631-632-9216 in New York
www.epa.gov/region01/eco/lis

New York State Department of Environmental Conservation
Bureau of Marine Resources
205 North Belle Meade Road; Suite 1
East Setauket, NY 11733
631-444-0469
www.dec.state.ny.us

Connecticut Department of Environmental Protection
Office of Long Island Sound Programs
79 Elm Street
Hartford, CT 06106-5127
860-424-3034
www.dep.state.ct.us

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